

# **VERDAD RESOURCES**

**WATTENBERG FIELD  
2N-64W-24 ARNOLD-HELEN PAD  
HELEN 2536-05H**

**Plan B  
Design #2**

## **Anticollision Summary Report**

**17 December, 2021**

## Anticollision Summary Report

<b>Company:</b>	VERDAD RESOURCES	<b>Local Co-ordinate Reference:</b>	Well HELEN 2536-05H
<b>Project:</b>	WATTENBERG FIELD	<b>TVD Reference:</b>	RKB = 20' @ 4944.00usft (Drilling Rig)
<b>Reference Site:</b>	2N-64W-24 ARNOLD-HELEN PAD	<b>MD Reference:</b>	RKB = 20' @ 4944.00usft (Drilling Rig)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HELEN 2536-05H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	3.28 usft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Plan B	<b>Database:</b>	EDM 5000.16 Single User Db
<b>Reference Design:</b>	Design #2	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	Design #2		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum centre distance of 1,500.00usft	<b>Error Surface:</b>	Pedal Curve
<b>Warning Levels Evaluated at:</b>	2.45 Sigma	<b>Casing Method:</b>	Added to Error Values

<b>Survey Tool Program</b>	<b>Date</b>	12/17/2021			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
0.00	1,908.00	Design #2 (Plan B)	ISCWSA MWD	Fixed:v2:standard declination	
1,908.00	17,088.21	Design #2 (Plan B)	ISCWSA MWD	Fixed:v2:standard declination	

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (usft)</b>	<b>Offset Measured Depth (usft)</b>	<b>Distance Between Centres (usft)</b>	<b>Distance Between Ellipses (usft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
2N-63W-19 KBL PAD						
KBL 1930-07H - Wellbore #1 - Design #1						Out of range
2N-64W-13 L.E. GERKIN PAD (RED HAWK)						
L.E. GERKIN 10H - Red Hawk Planned Well - Cathedral						Out of range
L.E. GERKIN 11H - Red Hawk Planned Well - Cathedral						Out of range
L.E. GERKIN 12H - Red Hawk Planned Well - Cathedral						Out of range
L.E. GERKIN 13H - Red Hawk Planned Well - Cathedral						Out of range
L.E. GERKIN 14H - Red Hawk Planned Well - Cathedral						Out of range
L.E. GERKIN 15H - Red Hawk Planned Well - Cathedral						Out of range
L.E. GERKIN 9H - Red Hawk Planned Well - Cathedral P	6,598.48	16,541.50	1,433.16	1,192.42	5.953	CC
L.E. GERKIN 9H - Red Hawk Planned Well - Cathedral P	6,600.00	16,541.50	1,433.16	1,192.40	5.953	ES
L.E. GERKIN 9H - Red Hawk Planned Well - Cathedral P	6,650.00	16,541.50	1,434.81	1,193.57	5.948	SF
2N-64W-13 Offsets						
ARNOLD #1 - Barrett Resources P/A Well - No Surveys						Out of range
DARYL L ARNOLD #1 - Amoco D/A Well - No Surveys						Out of range
2N-64W-24 ARNOLD-BOYD PAD						
BOYD 2413-05H - Plan A - Design #1	2,794.04	2,859.15	210.26	182.95	7.699	CC
BOYD 2413-05H - Plan A - Design #1	3,100.00	3,163.64	212.39	181.23	6.816	ES
BOYD 2413-05H - Plan A - Design #1	6,750.00	6,951.97	288.74	222.13	4.335	SF
BOYD 2413-06H - Plan A - Design #1	203.25	203.25	294.30	286.73	38.873	CC, ES
BOYD 2413-06H - Plan A - Design #1	6,750.00	6,918.79	790.86	724.58	11.932	SF
BOYD 2413-07H - Plan A - Design #1	203.25	203.25	306.27	298.70	40.455	CC, ES
BOYD 2413-07H - Plan A - Design #1	6,900.00	6,871.95	1,309.72	1,240.93	19.038	SF
BOYD 2413-08H - Plan A - Design #1	203.25	203.25	318.59	311.02	42.082	CC, ES
BOYD 2413-08H - Plan A - Design #1	5,700.00	5,547.37	1,493.53	1,437.28	26.551	SF
BOYD 2413-09H - Plan A - Design #1	203.25	203.25	331.45	323.87	43.780	CC, ES
BOYD 2413-09H - Plan A - Design #1	2,000.00	1,932.48	674.33	653.96	33.101	SF
BOYD 2413-10H - Plan A - Design #1	203.25	203.25	344.35	336.78	45.485	CC, ES
BOYD 2413-10H - Plan A - Design #1	2,000.00	1,885.94	745.34	725.75	38.058	SF
BOYD 2413-11H - Plan A - Design #1	116.91	115.91	357.31	349.78	47.446	CC
BOYD 2413-11H - Plan A - Design #1	203.25	201.35	357.31	349.74	47.200	ES
BOYD 2413-11H - Plan A - Design #1	2,000.00	1,789.33	845.42	826.38	44.411	SF

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<b>Reference Site:</b>	2N-64W-24 ARNOLD-HELEN PAD	<b>MD Reference:</b>	RKB = 20' @ 4944.00usft (Drilling Rig)
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<b>Reference Well:</b>	HELEN 2536-05H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	3.28 usft	<b>Output errors are at</b>	2.45 sigma
<b>Reference Wellbore</b>	Plan B	<b>Database:</b>	EDM 5000.16 Single User Db
<b>Reference Design:</b>	Design #2	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
2N-64W-24 ARNOLD-HELEN PAD						
HELEN 2536-06H - Plan B - Design #2	203.25	204.25	16.22	8.65	2.142	CC
HELEN 2536-06H - Plan B - Design #2	17,088.21	17,051.09	491.84	-40.70	0.924	Level 1, ES, SF
HELEN 2536-07H - Plan B - Design #2	203.25	204.25	32.16	24.59	4.248	CC, ES
HELEN 2536-07H - Plan B - Design #2	17,088.21	17,046.66	982.84	449.98	1.844	SF
HELEN 2536-08H - Plan B - Design #2	203.25	204.25	48.10	40.53	6.353	CC, ES
HELEN 2536-08H - Plan B - Design #2	17,088.21	17,081.20	1,427.17	894.37	2.679	SF
HELEN 2536-09H - Plan B - Design #2	203.25	203.25	64.04	56.47	8.459	CC, ES, SF
HELEN 2536-10H - Plan B - Design #2	203.25	203.25	79.98	72.41	10.565	CC, ES, SF
HELEN 2536-11H - Plan A - Design #1	203.25	203.25	96.20	88.63	12.707	CC, ES, SF
HELEN 2536-12H - Plan A - Design #1	116.44	116.44	112.14	104.61	14.891	CC
HELEN 2536-12H - Plan A - Design #1	203.25	203.17	112.14	104.57	14.813	ES, SF
2N-64W-24 Offsets						
BOYD 24-1H - VERDAD PR Well - Actual BKR Surveys	2,272.55	2,380.78	142.68	118.59	5.921	CC
BOYD 24-1H - VERDAD PR Well - Actual BKR Surveys	2,300.00	2,405.32	143.13	118.42	5.792	ES
BOYD 24-1H - VERDAD PR Well - Actual BKR Surveys	2,400.00	2,496.83	151.85	125.51	5.765	SF
BOYD 24-4H - VERDAD PR Well - Actual BKR Surveys	2,915.41	3,022.94	49.30	18.49	1.600	CC, ES, SF
HELEN 24-3H - VERDAD PR Well - Actual BKR Surveys	144.72	143.72	36.90	29.35	4.887	CC, ES
HELEN 24-3H - VERDAD PR Well - Actual BKR Surveys	16,600.00	16,883.00	835.50	338.47	1.681	SF
HELEN 24-4H - VERDAD PR Well - Actual BKR Surveys	100.00	97.99	16.82	9.28	2.232	CC
HELEN 24-4H - VERDAD PR Well - Actual BKR Surveys	320.72	318.43	16.82	9.12	2.186	ES
HELEN 24-4H - VERDAD PR Well - Actual BKR Surveys	16,400.00	16,498.90	506.10	24.33	1.050	Level 2, SF
MCCLINTOCK ET AL #1 - JUNIPER D/A Well - No Surve						Out of range
2N-64W-36 Offsets						
STATE C 14-36 - Noble Energy T/A Well - No Surveys	16,476.86	6,820.00	322.29	-169.14	0.656	Level 1, CC, SF
STATE C 14-36 - Noble Energy T/A Well - No Surveys	16,500.00	6,820.00	323.12	-169.36	0.656	Level 1, ES
STATE C 41-36 - Prima Exploration P/A Well - No Survey						Out of range

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Reference Depths are relative to RKB = 20' @ 4944.00usft (Drilling Rig)

Offset Depths are relative to Offset Datum

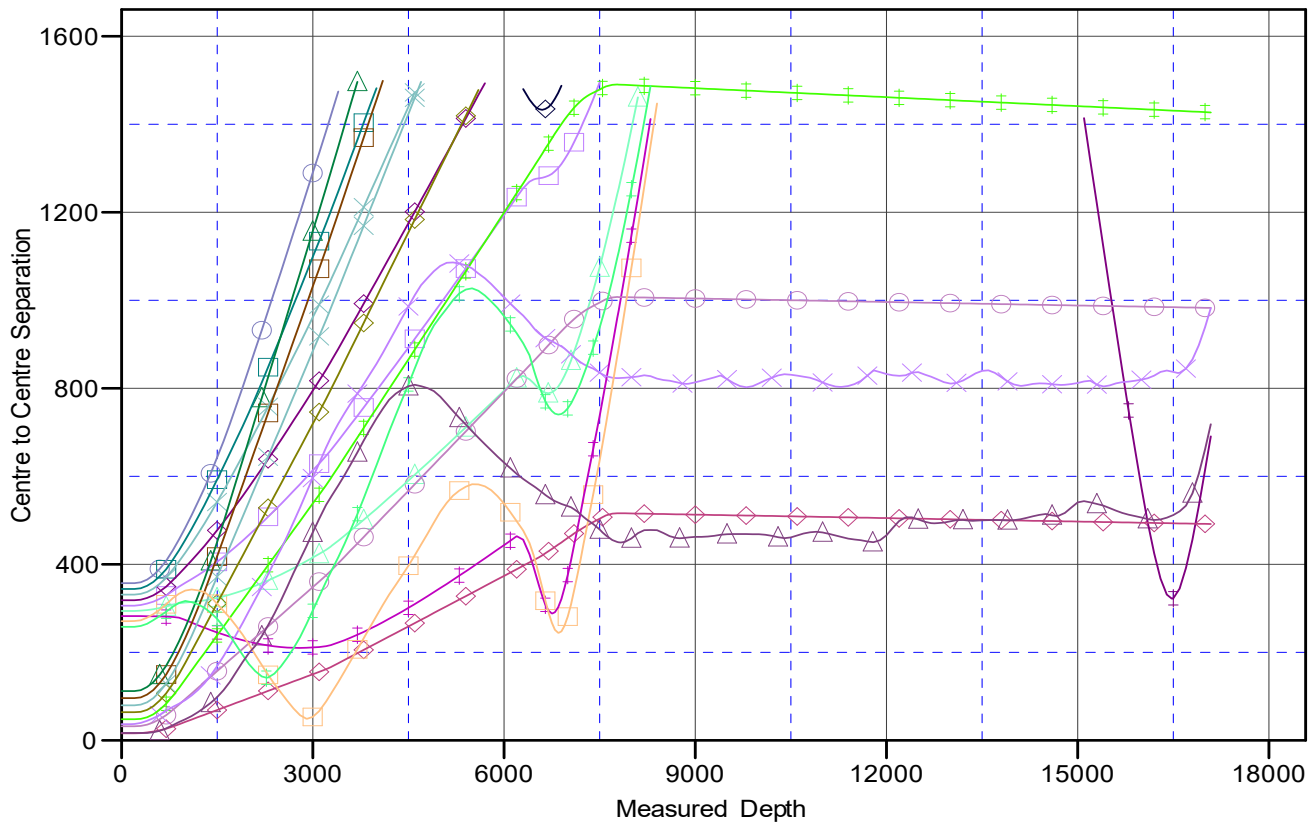
Central Meridian is -105.500000

Coordinates are relative to: HELEN 2536-05H

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.65°

### Ladder Plot



#### LEGEND

STATE C 14-36, Noble Energy T/A Well, No Surveys V0  
BOYD 2413-09H, Plan A, Design #1 V0  
BOYD 2413-07H, Plan A, Design #1 V0  
BOYD 2413-11H, Plan A, Design #1 V0  
BOYD 2413-08H, Plan A, Design #1 V0  
BOYD 2413-08H, Plan A, Design #1 V0

BOYD 2413-09H, Plan A, Design #1 V0  
HELEN 2536-09H, Plan B, Design #2 V0  
HELEN 2536-10H, Plan B, Design #2 V0  
HELEN 2536-11H, Plan A, Design #1 V0  
HELEN 2536-07H, Plan B, Design #2 V0  
HELEN 2536-12H, Plan A, Design #1 V0  
HELEN 2536-08H, Plan B, Design #2 V0

HELEN 2536-09H, Plan B, Design #2 V0  
HELEN 24-3H, VERDAD PR Well, Actual BKR Surveys V0  
BOYD 24-4H, VERDAD PR Well, Actual BKR Surveys V0  
BOYD 24-1H, VERDAD PR Well, Actual BKR Surveys V0  
HELEN 24-4H, VERDAD PR Well, Actual BKR Surveys V0  
L.E. GERKIN 3H, Red Hawk Planned Well, Cathedral Planned Surveys V0

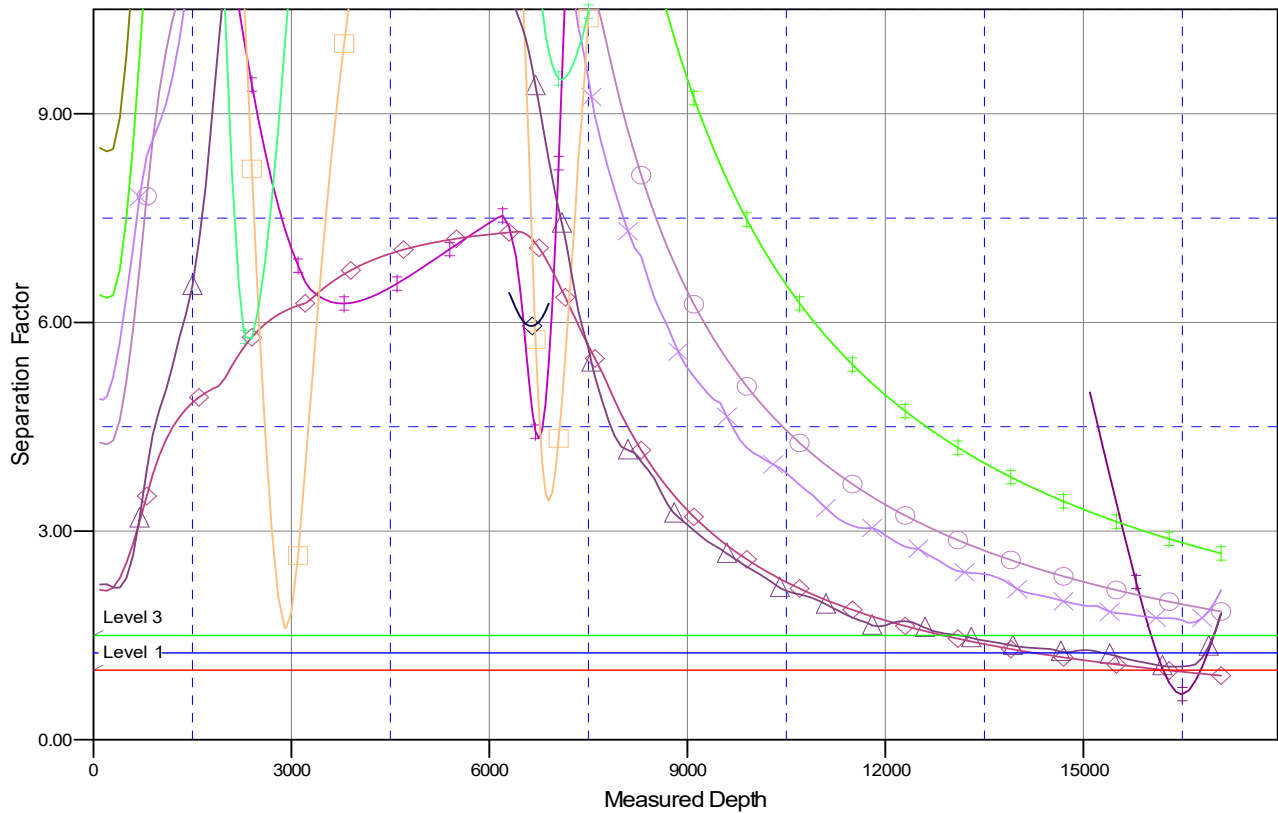
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Reference Depths are relative to RKB = 20' @ 4944.00usft (Drilling Rig)  
Offset Depths are relative to Offset Datum  
Central Meridian is -105.500000

Coordinates are relative to: HELEN 2536-05H  
Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: 0.65°

### Separation Factor Plot



#### LEGEND

STATE C 14-36, Noble Energy T/A Well, No Surveys V0  
BOYD 241309H, Plan A, Design #1 V0  
BOYD 241307H, Plan A, Design #1 V0  
BOYD 241311H, Plan A, Design #1 V0  
BOYD 241308H, Plan A, Design #1 V0  
BOYD 241308H, Plan A, Design #1 V0  
BOYD 241310H, Plan A, Design #1 V0

BOYD 241308H, Plan A, Design #1 V0  
HELEN 2536-09H, Plan B, Design #2 V0  
HELEN 2536-10H, Plan B, Design #2 V0  
HELEN 2536-11H, Plan A, Design #1 V0  
HELEN 2536-07H, Plan B, Design #2 V0  
HELEN 2536-12H, Plan A, Design #1 V0  
HELEN 2536-08H, Plan B, Design #2 V0

HELEN 2536-06H, Plan B, Design #2 V0  
HELEN 24-3H, VERDAD PR Well, Actual BKR Surveys V0  
BOYD 24-4H, VERDAD PR Well, Actual BKR Surveys V0  
BOYD 24-1H, VERDAD PR Well, Actual BKR Surveys V0  
HELEN 24-1H, VERDAD PR Well, Actual BKR Surveys V0  
HELEN 24-1H, VERDAD PR Well, Actual BKR Surveys V0  
L.E. GERKEN SH, Red Hawk Planned Well, Cathedral Planned Surveys V0